(54) Title: METHOD TO DETERMINE THE VALUE OF PROCESS PARAMETERS BASED ON SCATTEROMETRY DATA

a

| Measure response signal X N times for N different known sets of process parameters Y | → 501 |

Perform regression analysis → 502

Form mathematical model → 503

b

Measure response signal X' → 511

Use measured response signal X' as an input in mathematical model to determine process parameters Y' → 512

Use determined process parameters Y' → 513
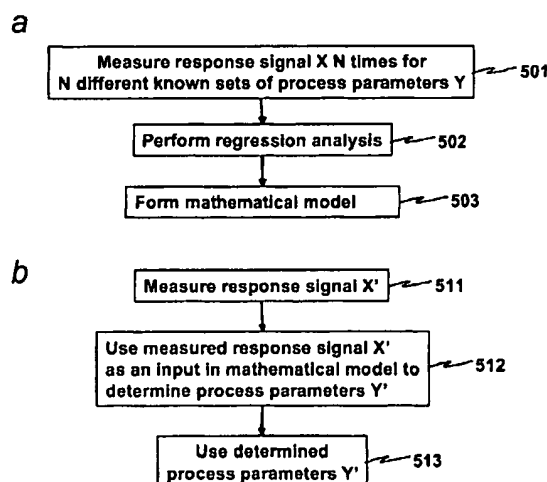
(57) Abstract: A method according to an embodiment includes obtaining calibration measurement data, with an optical detection apparatus, from a plurality of marker structure sets provided on a calibration substrate. Each marker structure set includes at least one calibration marker structure created using different known values of the process parameter. The method includes obtaining measurement data, with the optical detection apparatus, from at least on marker structure provided on a substrate and exposed using an unknown value of the process parameter; and determining the unknown value of the process parameter from the obtained measurement data by employing regression coefficients in a model based on the known values of the process parameter and the calibration measurement data.

FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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